

Forage Quality for Horses

By: Dr. Bill Vandergrift

Man creates many health and performance problems in horses because we forget that the horse is a constant grazer designed to forage approximately 16 hours per day. Instead we make attempts to fit their feeding schedule to ours or insist that their daily menu consist of what we have to offer instead of what they would prefer.

It is imperative that good quality forage forms the foundation of every horse's feeding program. Good quality forage increases the rate of fermentation in the horse's large intestine, stimulates increased water consumption and promotes more consistent appetite. Without an adequate intake of good forage your horse is more prone to weight loss, colic, poor feed utilization, dehydration and poor reproductive or athletic performance.

Good quality forage contains a moderate protein level, a moderate soluble carbohydrate level, a moderate structural carbohydrate level (fiber), a calcium: phosphorus level between 1.2:1 and 3.5:1, and no excessively high levels of individual minerals. Good quality forage should also have a texture and taste that is appealing to the horse; the horse is most often the final judge on this matter. Forages that are excessively dusty, moldy or sour smelling are usually not very appealing to the horse, but should be avoided for obvious health reasons regardless. Take note that the terms "good quality" and "moderate _ level" are purposely used in preference to "high quality" or "high _ level". Yes, forage can be "too good" and thereby create more problems for the horse than it solves. It is also important for it to be understood that we are defining the overall forage program, not individual forage sources that may or may not be combined to make up the overall diet for the horse.

How do we know what the protein, fiber and mineral levels are of a forage source? The only way to determine these values is to have the forage chemically analyzed. Different laboratories may use different methods to determine these values. While some methods may render slightly different values than others, the important point in regard to chemical analysis is to have it done. Slightly different values due to method are simply not that important in the overall scheme of things. How important is it for you to have your forage chemically analyzed? On a scale of 1 to 10, I give it a 6 unless we are dealing with one of the following conditions, in which case I give it a 10:

- 1 Unexpected incidence of colic
- 2 Weight loss or hard doing horses
- 3 Orthopedic disorders
- 4 Reproductive failure

5 Poor athletic performance

6 A full year's supply is purchased or stored from a single source

7 Consumption is less than expected

Preferred chemical values for forage on a dry matter basis are:

Crude Protein	8 – 14	%
Acid Detergent Fiber	less than 38	%
Calcium	greater than .25	%
Phosphorus	greater than .15	%
Calcium: phosphorus	1.2:1 – 3.5:1	ratio
Iron	less than 175	ppm
Manganese	less than 100	ppm
Zinc	25 - 75	ppm
Copper	greater than 8	ppm

Forage composition is extremely variable, even within a specified geographic area and even from month to month. That is why we use the term-preferred composition. Chances are high that the forage you are feeding right now contains at least one nutrient outside the preferred range. This does not mean you shouldn't feed it; rather this should serve as an alert that the rest of your horse's diet needs to be balanced to compensate for any forage inadequacy.

For example:

Let's assume you have purchased a large load of hay that contains 6% protein and 41% acid detergent fiber. The protein is low and the fiber high and from this we can assume that this forage is not highly digestible, nor will it provide a lot of calories or grams of protein per pound. On a daily basis we will notice that our horses are eating more forage and probably require more grain to maintain their desired body condition. Their hair coat may become a bit rough and their growth or performance may not be adequate. Having said that, many horses would adapt to this forage source quite well with the inclusion of additional grain, but remember, the horse is supposed to be a constant grazer, not a meal eater of grain. So if we really want to feed our horse the way he would prefer to be fed we should also feed a second forage source that is higher in protein and lower in acid detergent fiber so that the overall protein and fiber levels fall within our preferred range. This second forage source may be green pasture, a higher quality grass hay, alfalfa, or a standardized bagged forage. Feeding any of these in combination with the low protein, high fiber hay will allow us to keep grain intakes minimal, improve overall digestion and feed utilization and maintain acceptable health and performance levels.

If you are not having any problems with your horses or you are able to only purchase small amounts of forage at one time, the benefits of having your forage chemically analyzed may not justify the cost. If you elect to not have your forage chemically analyzed you can grossly estimate the quality of the forage physically and visually. As forages mature, the protein level drops and the fiber level increases. Forages that have “headed out” or already produced seed are fully mature and do not make good quality forage. Therefore, you should first visually inspect the prospective forage source for seed heads, weeds and other foreign matter. Also check for dust, mold or sour odors. If the forage source meets our criteria for these parameters we can then evaluate it physically by taking a hand full and balling it up in the palms of our hands. If the forage is pliable it is probably relatively low in fiber and therefore moderate in protein, which makes it an acceptable forage source for horses. If the forage is stiff and more like broom straw then it is probably high in fiber, low in protein and therefore not acceptable for horses. An exception to this guideline is alfalfa. Alfalfa can be evaluated by visually examining the amount of leaf in proportion to the amount of stem, the higher the leaf to stem ratio, the better the alfalfa. Note: due to the high protein and calcium levels normally found in alfalfa it is not recommended as the sole forage source for horses. Alfalfa works very nicely when fed in combination with grass forages such as hay and/or pasture, however.

Now that you have determined that your overall forage source is of good quality, the next question is how much of it do you feed. With few exceptions, the answer is as much as your horse will eat, however 10 – 12 pounds per day of pasture and/or hay combined is considered a minimum. When utilizing high quality forage sources such as alfalfa to balance off a low protein forage source, you should still feed more of the lower quality forage and try to be conservative with the alfalfa. Maintaining alfalfa intakes below 7 pounds per day is a good guideline. How many sections or flakes that is depends upon the size of the bale you are using. Over-feeding alfalfa can adversely affect the calcium: phosphorus ratio and contribute to excessive protein intakes. In young fast-growing horses this can lead to increased orthopedic disorders and in mature performance horses can increase the incidence of tying up. If your goal is to increase the amount of energy supplied from forage sources but you want to stay away from alfalfa in order to manage protein and calcium levels, you can incorporate shredded beet pulp into your horse's diet. This is easily done with one of the beet pulp based feeds now available such as Triple Crown Complete, Triple Crown Senior or Respond. Shredded beet pulp provides the same amount of energy per pound as alfalfa but will not add to the protein or calcium load of an already balanced diet.

Summary:

The horse is designed to consume forage on a regular and consistent basis and should be fed accordingly. Forage quality is extremely important to the horse and maintaining acceptable forage quality goes a long way to keeping horses healthy and performing up to their potential. Forage for horses should be moderate in protein and fiber levels. Forage that is too high in protein is just as bad as forage that is too low. Different forage sources such as grass hay, grass pasture and/or alfalfa hay are often combined in a feeding program in order to provide an overall forage program with acceptable protein,

fiber and mineral levels and balances. Feeding adequate amounts of good quality forage to your horse each day will allow you to feed the smallest amount of grain needed to maintain desired body condition and energy levels. This should be your goal in order to maximize your horse's health and performance.